INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP99/07101

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] C07D207/333, 231/12, 307/46, 277/36, 277/24, 333/24, 333/34, 401/14, 403/06, 405/06, 409/14, 405/14, 417/06, 409/06, 413/06, 401/06, 405/12, 417/12, A61K31/40, 31/4196, 31/4155, 31/4439, 31/4025, 31/427, 31/4178, 31/381, 31/422, 31/443, 31/4245, 31/497, 31/4725, 31/506, 31/433, 31/4184, 31/4709, 31/415, 31/341, 31/426, A61P31/18, 31/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[7] C07D207/333, 231/12, 307/46, 277/36, 277/24, 333/24, 333/34, 401/14, 403/06, 405/06, 409/14, 405/14, 417/06, 409/06, 413/06, 401/06, 405/12, 417/12, A61K31/40, 31/4196, 31/4155, 31/4439, 31/4025, 31/427, 31/4178, 31/381, 31/422, 31/443, 31/4245, 31/497, 31/4725, 31/506, 31/433, 31/4184, 31/4709, 31/415, 31/341, 31/426, A61P31/18, 31/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
REGISTRY (STN), CA (STN), CAOLD (STN), CAPLUS (STN)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	Sainsbury, Malcolm et al., "Improved synthesis of 6H-pyrido[4,3-b]carbazole derivatives", J. Chem. Soc., Perkin Trans. 1 (1975), (3), 289-98	2,4,5,10 1,3,6-9,11-24, 26-32
X A	Lesiak, Tadeusz et al., "New β-diketones of furan series", Rocz. Chem. (1971), 45(5), 903-9	2,4-8,10 1,3,9,11-24,26 -32
X A	Kurkovskaya, L. N et al., "Intramolecular hydrogen bonding in selenophene β-diketones studied by a PMR method", Teor. Eksp. Khim. (1972), 8(5), 688-91	2,10 1,3-9,11-24,26 -32
X A	Spirkova, K. et al., "Furan derivatives. 202. Nucleophilic substitution reactions of 2-cyano-3-methyl-3-(5-X-2-furyl) acrylonitriles", Chem. Pap. (1987), 41(6), 787-92, see Compounds I, II	30,31 1-24,26-29,32
X A	US, 5292732, A (Hoffmann-La Roche Inc.), 08 March, 1994 (08.03.94) see Compound V & JP, 06-239865, A & EP, 521368, A1 & ZA, 9204720, A & CA, 2072836, A	30 1-24,26-29,31, 32

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 March, 2000 (15.03.00)	28 March, 2000 (28.03.00)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP99/07101

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP, 51-075096, A (Shigetaka Yoshina), 29 June, 1976 (29.06.76), see Example 8 (Family: none)	30 1-24,26-29,31, 32
X A	US, 4637829, A (Ciba-Geigy Corporation), 20 January, 1987 (20.01.87), & JP, 60233072, A & EP, 159966, A1 & CA, 1217488, A	30 1-24,26-29,31, 32
X A	US, 5112848, A (Abbott Laboratories), 12 March, 1992 (12.03.92), see Example 2 & JP, 03-500887, T & WO, 8904299, A1 & EP, 320628, A1 & CA, 1334975, A	30 1-24,26-29,31, 32
X A	US, 3931247, A (Morton-Norwich Products, Inc.), 06 January, 1976 (06.01.76), see Examples II-VI (Family: none)	30 1-24,26-29,31, 32
X A	US, 4332735, A (Morton-Norwich Products, Inc.), 01 June 1982 (01.06.82), see Example A (Family: none)	30 1-24,26-29,31, 32
X A	Kazuaki Oda, et al., " Photochemistry of the nitrogen-thiocarbonyl systems. Part 24. Photoreactions of thiobenzamide with various substituted furans: regioselective β-benzoylation and transformation of furans to other aromatic compounds", J. Chem. Soc., Perkin Trans. 1 (1995), (22), 2931-5	30 1-24,26-29,31, 32
X A	Zani, C. L. et al., "Efficient directed ortho metalation-based route to cytotoxic furanonaphthoquinone natural products", Tetrahedron Lett. (1987), 28(52), 6561-4	30 1-24,26-29,31, 32
X A	Itahara, Toshio et al., "Arylation of aromatic heterocycles with arenes and palladium(II) acetate", J. Org. Chem. (1985), 50(25), 5272-5	30 1-24,26-29,31, 32
X A	Oleinik, A. F. et al., "nthesis and antileishmaniasis activity of arylfurylquinoxalines", Khim.-Farm. Zh. (1978), 12(7), 71-7	30 1-24,26-29,31, 32
X A	Cernak, Jozef et al., Electrochemical reduction of para-substituted 2-acyl-5-phenylfurans in dimenthylformamide", Collect. Czech. Chem. Commun. (1981), 46(2), 498-502	30 1-24,26-29,31, 32
X A	Sarma, C. R. et al., "Antiinflammatory agents. Part X. Synthesis and antiinflammatory activity of some new [4-[[5-formyl(acyl)-2-furyl]oxy]phenyl]alkanoic acid esters", Indian J. Chem., Sect. B (1989), 28B(11), 993-5	30 1-24,26-29,31, 32
X A	Koyanagi, Jyunichi et al., " A facile synthesis of 2-acetylnaphtho[2,3-b]furan-4, 9-dione", J. Heterocycl. Chem. (1995), 32(4), 1289-91	30 1-24,26-29,31, 32
X A	Bisagni, Emile et al., "2,3-Disubstituted furans and pyrroles. I. Extension of the Feist-Benary reaction to β-diketones. New synthesis of 3-acylated furans and	30 1-24,26-29,31, 32

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP99/07101

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	pyrroles", Bull. Soc. Chim. Fr. (1967), (8), 2796-80	
X A	Aly, El-Said Ahmed et al., "A new synthetic route to various 2, 5-distributed furan derivatives", Proc. Pak. Acad. Sci. (1993), 30(3), 163-7	30 1-24,26-29,31, 32
X A	Kondrat'eva, G. Ya. et al., "Reaction of oxazoles with acetylenic aldehydes and ketones", Izv. Akad. Nauk SSSR, Ser. Khim. (1971), (6), 1363-4	30 1-24,26-29,31, 32,
X A	Mndzhoyan, A. L. et al., "Furan derivatives. XXXI. Some acid 2-alkylidene hydrazides and N,N'-diacyl hydrazines as potential antitubercular agents", Arm. Khim. Zh. (1966), 19(10), 793-805	30 1-24,26-29,31, 32
X A	Sjoholm, Rainer et al., "Reactions between furylketones and Grignard reagents. I. Conjugate additions to 2-acetylfuran", Acta Acad. Abo., Ser. B (1978), 38(1), 9	30 1-24,26-29,31, 32
X A	Ma, Yinmin et al., "Synthesis and ultraviolet-visible spectrum of arylfurylphenylpropenones", Xibei Daxue Xuebao, Ziran Kexueban (1991), 21(3), 55-9	30 1-24,26-29,31, 32
PX PA	WO, 99/62513, A1 (Merck & Co., Inc.), 09 December, 1999 (09.12.99), Claims (Family: none)	1,23,24,26 2-22,27-32
PX PA	WO, 99/62520, A1 (Merck & Co., Inc.), 09 December, 1999 (09.12.99), Claims (Family: none)	1,23,24,26 2-22,27-32

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP99/07101

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 25
because they relate to subject matter not required to be searched by this Authority, namely:

Claim 25 pertains to methods of treatment of AIDS and these methods include those for treatment of the human body by therapy. Thus, claim 25 relates to a subject matter which this International Searching Authority is not required to search.

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

国際調査報告

国際出願番号　ＰＣＴ／ＪＰ９９／０７１０１

A.　発明の属する分野の分類（国際特許分類（ＩＰＣ））

Int.Cl[7] C07D207/333, 231/12, 307/46, 277/36, 277/24, 333/24, 333/34, 401/14, 403/06, 405/06, 409/14, 405/14, 417/06, 409/06, 413/06, 401/06, 405/12, 417/12, A61K31/40, 31/4196, 31/4155, 31/4439, 31/4025, 31/427, 31/4178, 31/381, 31/422, 31/443, 31/4245, 31/497, 31/4725, 31/506, 31/433, 31/4184, 31/4709, 31/415, 31/341, 31/426, A61P31/18, 31/12

B.　調査を行った分野

調査を行った最小限資料（国際特許分類（ＩＰＣ））

Int.Cl[7] C07D207/333, 231/12, 307/46, 277/36, 277/24, 333/24, 333/34, 401/14, 403/06, 405/06, 409/14, 405/14, 417/06, 409/06, 413/06, 401/06, 405/12, 417/12, A61K31/40, 31/4196, 31/4155, 31/4439, 31/4025, 31/427, 31/4178, 31/381, 31/422, 31/443, 31/4245, 31/497, 31/4725, 31/506, 31/433, 31/4184, 31/4709, 31/415, 31/341, 31/426, A61P31/18, 31/12

最小限資料以外の資料で調査を行った分野に含まれるもの

国際調査で使用した電子データベース（データベースの名称、調査に使用した用語）

REGISTRY (STN), CA (STN), CAOLD (STN), CAPLUS (STN)

C.　関連すると認められる文献

引用文献のカテゴリー＊	引用文献名　及び一部の箇所が関連するときは、その関連する箇所の表示	関連する請求の範囲の番号
X A	Sainsbury, Malcolm et al.,"Improved synthesis of 6H-pyrido [4,3-b]carbazole derivatives", J. Chem. Soc., Perkin Trans. 1 (1975), (3), 289-98	2,4,5,10 1,3,6-9,11-24,26-32
X A	Lesiak, Tadeusz et al.,"New β-diketones of furan series", Roczz. Chem. (1971), 45(5), 903-9	2,4-8,10 1,3,9,11-24,26-32
X A	Kurkovskaya, L. N et al.,"Intramolecular hydrogen bonding in selenophene β-diketones studied by a PMR method", Teor. Eksp. Khim. (1972), 8(5), 688-91	2,10 1,3-9,11-24,26-32

[x] C欄の続きにも文献が列挙されている。　　[ ] パテントファミリーに関する別紙を参照。

＊　引用文献のカテゴリー

「A」特に関連のある文献ではなく、一般的技術水準を示すもの

「E」国際出願日前の出願または特許であるが、国際出願日以後に公表されたもの

「L」優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献（理由を付す）

「O」口頭による開示、使用、展示等に言及する文献

「P」国際出願日前で、かつ優先権の主張の基礎となる出願の日の後に公表された文献

「T」国際出願日又は優先日後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの

「X」特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの

「Y」特に関連のある文献であって、当該文献と他の１以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの

「&」同一パテントファミリー文献

国際調査を完了した日	国際調査報告の発送日
１５．０３．００	28.03.00

国際調査機関の名称及びあて先	特許庁審査官（権限のある職員）	４Ｐ	９６３８
日本国特許庁（ＩＳＡ／ＪＰ） 郵便番号１００－８９１５ 東京都千代田区霞が関三丁目４番３号	中木　亜希		
	電話番号　０３－３５８１－１１０１　内線　３４９２		

様式ＰＣＴ／ＩＳＡ／２１０（第２ページ）（１９９８年７月）

国際調査報告	国際出願番号 PCT／JP99／07101

C（続き）. 関連すると認められる文献

引用文献のカテゴリー＊	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する請求の範囲の番号
X A	Spirkova, K. et al., " Furan derivatives. 202. Nucleophilic substitution reactions of 2-cyano-3-methyl-3-(5-X-2-furyl) acrylonitriles", Chem. Pap. (1987), 41(6), 787-92 化合物Ⅰ, II参照	30, 31 1-24, 26-29, 32
X A	US, 5292732, A (Hoffmann-La Roche Inc.) 8.3月.1994(08.03.94) 化合物Ⅴ参照 &JP, 06-239865, A &EP, 521368, A1 &ZA, 9204720, A &CA, 2072836, A	30 1-24, 26-29, 31, 32
X A	JP, 51-075096, A (吉名重多賀) 29.6月.1976(29.06.76) 実施例８参照 (ファミリーなし)	30 1-24, 26-29, 31, 32
X A	US, 4637829, A (Ciba-Geigy Corporation) 20.1月.1987(20.01.87) &JP, 60233072, A &EP, 159966, A1 &CA, 1217488, A	30 1-24, 26-29, 31, 32
X A	US, 5112848, A (Abbott Laboratories) 12.3月.1992(12.03.92) Example2 参照 &JP, 03-500887, T &WO, 8904299, A1 &EP, 320628, A1 &CA, 1334975, A	30 1-24, 26-29, 31, 32
X A	US, 3931247, A (Morton-Norwich Products, Inc.) 6.1月.1976(06.01.76) ExampleII-VI参照 (ファミリーなし)	30 1-24, 26-29, 31, 32
X A	US, 4332735, A (Morton-Norwich Products, Inc.) 1.6月.1982(01.06.82) ExampleA 参照 (ファミリーなし)	30 1-24, 26-29, 31, 32
X A	Oda, Kazuaki et al., "Photochemistry of the nitrogen-thiocarbonyl systems. Part 24. Photoreactions of thiobenzamide with various substituted furans: regioselective β-benzoylation and transformation of furans to other aromatic compounds", J. Chem. Soc., Perkin Trans. 1 (1995), (22), 2931-5	30 1-24, 26-29, 31, 32
X A	Zani, C. L. et al., "Efficient directed ortho metalation-based route to cytotoxic furanonaphthoquinone natural products", Tetrahedron Lett. (1987), 28(52), 6561-4	30 1-24, 26-29, 31, 32
X A	Itahara, Toshio et al., "Arylation of aromatic heterocycles with arenes and palladium(II) acetate", J. Org. Chem. (1985), 50(25), 5272-5	30 1-24, 26-29, 31, 32
X A	Oleinik, A. F. et al., "nthesis and antileishmaniasis activity of arylfurylquinoxalines", Khim.-Farm. Zh. (1978), 12(7), 71-7	30 1-24, 26-29, 31, 32
X A	Cernak, Jozef et al., "Electrochemical reduction of para-substituted 2-acyl-5-phenylfurans in dimethylformamide", Collect. Czech. Chem. Commun. (1981), 46(2), 498-502	30 1-24, 26-29, 31, 32
X A	Sarma, C. R. et al., "Antiinflammatory agents. Part X. Synthesis and antiinflammatory activity of some new [4-[[5-formyl(acyl)-2-furyl]oxy]phenyl]alkanoic acid esters", Indian J. Chem., Sect. B (1989), 28B(11), 993-5	30 1-24, 26-29, 31, 32

C（続き）．　関連すると認められる文献

引用文献のカテゴリー	引用文献名	関連する請求の範囲の番号
X A	Koyanagi, Jyunichi et al.,"A facile synthesis of 2-acetylnaphtho[2,3-b]furan-4,9-dione", J. Heterocycl. Chem. (1995), 32(4), 1289-91	30 1-24,26-29,31,32
X A	Bisagni, Emile et al.,"2,3-Disubstituted furans and pyrroles. I. Extension of the Feist-Benary reaction to β-diketones. New synthesis of 3-acylated furans and pyrroles", Bull. Soc. Chim. Fr. (1967), (8), 2796-80	30 1-24,26-29,31,32
X A	Aly, El-Said Ahmed et al.,"A new synthetic route to various 2,5-distributed furan derivatives", Proc. Pak. Acad. Sci. (1993), 30(3), 163-7	30 1-24,26-29,31,32
X A	Kondrat'eva, G. Ya. et al.,"Reaction of oxazoles with acetylenic aldehydes and ketones", Izv. Akad. Nauk SSSR, Ser. Khim. (1971), (6), 1363-4	30 1-24,26-29,31,32
X A	Mndzhoyan, A. L. et al.,"Furan derivatives. XXXI. Some acid 2-alkylidene hydrazides and N,N'-diacyl hydrazines as potential antitubercular agents", Arm. Khim. Zh. (1966), 19(10), 793-805	30 1-24,26-29,31,32
X A	Sjoholm, Rainer et al.,"Reactions between furylketones and Grignard reagents. I. Conjugate additions to 2-acetylfuran", Acta Acad. Abo., Ser. B (1978), 38(1), 9	30 1-24,26-29,31,32
X A	Ma, Yinmin et al.,"Synthesis and ultraviolet-visible spectrum of arylfurylphenylpropenones", Xibei Daxue Xuebao, Ziran Kexueban (1991), 21(3), 55-9	30 1-24,26-29,31,32
PX PA	WO,99/62513,A1 (MERCK & CO.,INC.) 9.12月.1999(09.12.99) 特許請求の範囲参照　（ファミリーなし）	1,23,24,26 2-22,27-32
PX PA	WO,99/62520,A1 (MERCK & CO.,INC.) 9.12月.1999(09.12.99) 特許請求の範囲参照　（ファミリーなし）	1,23,24,26 2-22,27-32

国際調査報告

国際出願番号　ＰＣＴ／ＪＰ９９／０７１０１

第Ⅰ欄　請求の範囲の一部の調査ができないときの意見（第１ページの２の続き）

法第８条第３項（ＰＣＴ１７条(2)(a)）の規定により、この国際調査報告は次の理由により請求の範囲の一部について作成しなかった。

1．[x] 請求の範囲 ２５ は、この国際調査機関が調査をすることを要しない対象に係るものである。
つまり、
請求の範囲２５に係る発明は、エイズの治療方法に係るものであり、該方法は人の身体の治療方法を包含するものであるから、国際調査機関が調査をすることを要しない対象に係るものである。

2．[ ] 請求の範囲 ＿＿＿＿＿＿ は、有意義な国際調査をすることができる程度まで所定の要件を満たしていない国際出願の部分に係るものである。つまり、

3．[ ] 請求の範囲 ＿＿＿＿＿＿ は、従属請求の範囲であってＰＣＴ規則6.4(a)の第２文及び第３文の規定に従って記載されていない。

第Ⅱ欄　発明の単一性が欠如しているときの意見（第１ページの３の続き）

次に述べるようにこの国際出願に二以上の発明があるとこの国際調査機関は認めた。

1．[ ] 出願人が必要な追加調査手数料をすべて期間内に納付したので、この国際調査報告は、すべての調査可能な請求の範囲について作成した。

2．[ ] 追加調査手数料を要求するまでもなく、すべての調査可能な請求の範囲について調査することができたので、追加調査手数料の納付を求めなかった。

3．[ ] 出願人が必要な追加調査手数料を一部のみしか期間内に納付しなかったので、この国際調査報告は、手数料の納付のあった次の請求の範囲のみについて作成した。

4．[ ] 出願人が必要な追加調査手数料を期間内に納付しなかったので、この国際調査報告は、請求の範囲の最初に記載されている発明に係る次の請求の範囲について作成した。

追加調査手数料の異議の申立てに関する注意
[ ] 追加調査手数料の納付と共に出願人から異議申立てがあった。
[ ] 追加調査手数料の納付と共に出願人から異議申立てがなかった。